

**What is claimed is;**

1. A planar reference electrode including plate (4);  
electrode connection part (1) ; electrode (3);  
5 insulating membrane (2); inner reference solution  
(5); junction (7 or 9); and the outer protection  
membrane (6, 8 or 9), wherein the junction  
comprises porous substance such as cotton thread,  
glass fiber, cellulose nitrate, cellulose acetate,  
10 filter paper and any material that can exhibit  
capillary action; porous polymer membrane; or a  
capillary either printed on the substrate or  
inserted with a thin film.
- 15 2. The planar reference electrode as set forth in  
claim 1, wherein the porous polymer membrane  
comprises cellulose nitrate.
- 20 3. The planar reference electrode as set forth in  
claim 1, wherein the plate (4) is selected from  
the group consisting of alumina, glass and plastic  
substance.
- 25 4. The planar reference electrode as set forth in  
claim 1, wherein the electrode (3) is selected  
from the group consisting of Ag, Pd, Cu, Pt,  
Ag/AgCl, Ag containing 1-5 weight% of Pd and Ag

coated with Nafion.

- 5            5. The planar reference electrode as set forth in  
            claim 1, wherein the inner reference solution (5)  
            is the electrolyte containing hydrogel which  
            consists of 85-99% weight% of glycerol solution;  
            1-19 weight% of agar solution; polymeric glue; or  
10            a soluble polymer dissolved with hygroscopic  
            substance.
6. The planar reference electrode as set forth in  
            claim 5, wherein the electrolyte is  $\text{AgNO}_3$  or  
            perchloric acid for the Ag electrode, KCl or NaCl  
15            for the Ag/AgCl electrode, and KOH or NaOH for the  
            mercury/mercury oxide electrode.
7. The planar reference electrode as set forth in  
            claim 1, wherein the protection membrane (6, 8 or  
20            9) is polymeric substance including polyester or  
            porous polymer membrane.
8. A method for fabricating the planar reference  
            electrode of claim 1 which comprises 7 stages;  
25            (1) forming electrode connection part (1) on the  
            plate (4);  
            (2) forming conductor lines (3) on the plate (4)

by using the screen printing method;

(3) forming insulating layer (2) by screen printing on the conductors (3) formed at step 2, while excluding electrode site and connection sites;

(4) forming insoluble metal salt layer on the electrode site;

(5) placing a thin film that can provide a well around the electrode site and a line of capillary onto the substrate;

(6) placing inner reference solution (5) within the well; and

(7) forming protection membrane layer (8) that can cover the inner reference solution.

9. A method for fabricating the planar reference electrode of claim 1 which comprises 6 stages;

(1) forming electrode connection part (1) on the plate (4);

(2) forming electrodes (3) on the plate (4) by using the screen printing method;

(3) forming insulating layer (2) by screen printing on the conductors (3) formed at step 2, while excluding the electrode site and connection site (1);

(4) forming insoluble metal salt layer onto the electrode;

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- (5) forming hydrogel layer (5) using soluble polymer containing highly concentrated electrolyte; and
- (6) forming porous polymer protection membrane (9) on the hydrogel layer using porous polymer covering hydrogel layer completely.